

homozygous and recessive for the pubescent fruit character. The presence or absence of pubescence on the siliques of *D. Wislizenii* is of no taxonomic significance.

—GRAY HERBARIUM OF HARVARD UNIVERSITY.

#### LITERATURE CITED

- PAYSON, E. B. 1918. Notes on Certain Cruciferae. *Ann. Mo. Bot. Gard.* **5:** 148.  
 ROLLINS, REED C. 1940. A Monographic Study of *Arabis* in Western North America. *RHODORA* **43:** 299.  
 ———, ———. 1952. Taxonomy Today and Tomorrow. *RHODORA* **54:** 13.  
 WOOTON, E. O. AND P. C. STANLEY. 1913. Contrib. U. S. Nat. Herb. **16:** 124.
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### A TAXONOMIC STUDY OF THE GENUS PHYSALIS IN NORTH AMERICA NORTH OF MEXICO

U. T. WATERFALL

(Concluded from p. 142)

Among the 481 sheets of 450 collections studied, material has been seen from Manitoba, Ontario (*Macoun* 54525, NY) and Quebec (*Marie-Victorin* et al 46421, GH) in Canada, and in the United States from: Alabama, Arkansas, Colorado (Boulder and El Paso Cos.), Connecticut, Delaware, Florida (Lafayette Co.), Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana (*Short*, NY), Maine (Cumberland Co.), Massachusetts, Michigan, Minnesota, Mississippi (University Campus), Missouri, Nebraska, New Hampshire (Coös and Merrimack Cos.), New Jersey (Middlesex Co.), New York (Staten Island), North Carolina, North Dakota, Ohio (Lorain Co.), Oklahoma, Pennsylvania (Chester Co.), Rhode Island, South Carolina (Aiken Co.), South Dakota, Tennessee, Texas, Utah (Washington Co.) Virginia, Washington D. C., West Virginia (Monroe Co.) and Wisconsin.

9b. ***P. virginiana*** Miller, var. ***subglabrata*** (Mackenzie and Bush) Waterfall, comb. et stat. nov., based on *P. subglabrata* Mackenzie and Bush, *Trans. Acad. Sci. St. Louis* **12:** 86–87. 1902.

Plants nearly glabrous, or with a few short antrorse hairs; leaf blades mostly ovate to ovate-lanceolate, their margins usually entire, sometimes slightly sinuate-dentate; anthers tinged or margined with blue or violet; fruiting calyces mostly 25–35 mm. long and 20–30 mm. wide.

TYPE: *K. K. Mackenzie* collected at Sheffield, Jackson Co., Missouri, June 14, 1896 (NY).

This variety grows in woods, grassland, roadsides, fields, and other disturbed sites, primarily in the northeastern United States, but with scattered collections elsewhere; it flowers mostly from June to September.

Four hundred thirteen sheets of 267 collections have been studied. This taxon occurs in Ontario, Canada, and in Arkansas, Colorado (Gunnison and Routt Cos.), Connecticut, Delaware, Georgia (Wayne Co.), Idaho (Ada, Canyon and Payett Cos.), Illinois, Indiana, Iowa, Kansas (Douglas, Ellis and Shawnee Cos.), Kentucky, Louisiana (East Feliciana and Grant Parishes), Maryland, Massachusetts, Michigan, Mississippi (Coahoma Co.), Missouri, Nebraska (Kearney and Nemaha Cos.), New Jersey, New Mexico (Lincoln Co.), New York, North Carolina, Ohio, Oklahoma (Rogers and Tulsa Cos.), Oregon (Polk Co.), Pennsylvania, Rhode Island, South Carolina (Pickens Co.), Tennessee, Texas (Delta, Nueces and Potter Cos.), Utah (San Juan and Sanpete Cos.), Virginia, Washington D. C., West Virginia, Wisconsin.

Sometimes forms are found with larger fruiting calyces which are 4–5 cm. long and 3–4 cm. broad. These may be called *Physalis virginiana* f. **macrophysa** (Rydberg) Waterfall, comb. et stat. nov. based on *P. macrophysa* Rydberg, Bull. Torr. Bot. Club 22: 308. 1895.

**TYPE:** Since Rydberg cited several number without choosing a type, the author selects as LECTOTYPE A. A. Heller 1756 (NY); isolectotypes: (NY, UC).

Although the latter name antedates *subglabrata*, the author has chosen to transfer the name *subglabrata* to varietal status, since it is associated with a large, wide-spread population, primarily of the northeastern United States. According to Article 70 of the Rules no name has priority outside its own rank. Article 71, Recommendation 71A suggests that in changing rank it is preferable to retain the original epithet unless it must be rejected under the rules. This particular choice of names seems to be in accordance with both articles, and keeps available the names now in usage, instead of either changing their application, or supplanting them with new names which would be permissible under the rules.

Selected specimens: ARKANSAS Marion Co.: Demaree 20645 (NY); ILLINOIS: Peoria Co.: McDonald Aug. 1903 (NY); Champaign Co.: Gleason Oct. 7, 1907 (DUKE); INDIANA: Lawrence Co.: Kriebel 1348 (DUKE); Iowa: Story Co.: Hayden 424 (GH); MISSOURI: Jackson Co.: Bush 12483A (NY) and 12483 (DUKE); NEBRASKA: Howard Co.: Bates 4910 (GH); New Jersey: Somerset Co.: Lighthipe Aug. 1, 1916 (TEX); TEXAS: Comal Co.: Lindheimer May 1847 (GH); Kerr Co.: Heller 1756 (NY, UC); Tarrant Co.: Ruth 746 (NY, PH); Travis Co.: Tharp May 6, 1931 (TEX).

9c. *P. virginiana* Miller, var. **texana** (Rydberg) Waterfall, comb. et stat. nov., based on *P. texana* Rydberg, Mem. Torr. Bot. Club 4: 339–340. 1896.

Plant usually several-branched from the base; herbage glabrous or nearly so; principal leaves ovate and usually entire; plant of the Gulf coast of Texas, apparently intergrading inland with contiguous varieties.

**TYPE:** The type is A. A. Heller 1507 NY; isotypes: ARIZ, GH, PH, UC.

This is primarily a taxon of the coastal area, but it extends inward through chaparral and other habitats nearly to central Texas, becoming more atypical as it does so. It usually flowers from March to June, but

flowering specimens have been seen that were collected in December and in August.

Selected from 35 sheets of 17 collections: TEXAS: Bexar Co.: Metz 73 (MICH, NY); Cameron Co.: Parks 17943 (GH); Gonzales Co.: Tharp 51-556 (TEX); LaSalle Co.: Tharp and Tyson 52-488 (OKLA, TEX); Nueces Co.: Tharp, Johnston and Webster 48-58 (TEX, ARK, OKLA); San Saba Co.: Palmer 11841 (TEX); Travis Co.: Tharp and Scarbrough 51-399 (COLO, OKLA, TEX, UARK); Victoria Co.: Tharp 2516 (TEX); Washington Co.: Tharp July 9, 1929 (OKLA, TEX); Wilson Co.: Palmer 947 (GH, NY).

9d. **P. virginiana** Miller, var. **sonorae** (Torrey) Waterfall, comb. nov., based on *P. pumila* Nutt., var. *sonorae* Torr., Botany of the Mexican Boundary 153. 1859; *P. longifolia* Nutt., Trans. Am. Phil. Soc. (n.s.) 5: 193-194. 1836; *P. lanceolata* Michx., var. *laevigata* Gray, Proc. Am. Acad. Arts and Sciences 10: 68. 1875; *P. lanceolata* Michx., var. *longifolia* (Nutt.) Trelease, Rep. Ark. Geol. Surv. 4: 207. 1891; *P. rigida* Pollard and Ball, Proc. Biol. Soc. Wash. 13: 134-135. 1900.

Since, according to Article 70, "When the rank . . . of an infrageneric taxon is changed, the correct name or epithet is the earliest legitimate one available in the new rank," the well-known name *longifolia* must be replaced in the varietal status with the relatively unknown *sonorae*.

Plants usually single stemmed, often branching above; leaf blades usually lanceolate to lanceolate-linear, but rarely ovate, their margins entire to irregularly toothed; herbage sparsely covered with short antrorse hairs, which are more abundant on the younger parts, sometimes nearly glabrous; calyx often with ten lines of short antrorse hairs; anthers yellow. Sometimes this variety is difficult to separate from var. *subglabrata*. In such cases the bluish, or violet, anthers of the latter is considered a distinguishing characteristic since it occurs in a large population of the northeastern United States where the yellow-anthered var. *sonorae* is not found.

TYPE: *Geo. Thurber* 418, Fronteras, Sonora, Mexico, June 1851 in the Herbarium of the New York Botanical Garden. Two isotypes are in the Gray Herbarium.

Habitat, distribution and flowering time: This variety grows in prairies, plains, foothills, canyons, open woods, sandy areas and in various disturbed habitats. Its primary distribution is in the prairie region of central United States, but it extends into and west of the Rockies. It flowers in June, July and August in the northern part of its range, and from May through September in Texas and Arizona.

Four hundred sixty seven sheets of 385 collections have been studied. They were collected in Arizona, Arkansas, California (Trinity Co.), Colorado, Georgia (Whitfield Co.), Idaho, Illinois, Indiana, Iowa, Kansas, Nebraska, Nevada (Churchill and Storey Cos.), New Mexico, North Carolina, Oklahoma, Oregon (Malheur Co.), Pennsylvania (*Small*, 1889), South Dakota, Tennessee (Davidson Co.), Texas, Utah, Virginia (King George Co.), West Virginia (Mineral Co.), Wisconsin, and Wyoming (Park and Weston Cos.).

It is probable that the records from the far west represent introductions.

9e. **P. virginiana** Miller, var. **hispida** Waterfall, var. nov., foliis ovato-

lanceolatis vel lanceolatis, vel spathulato-lanceolatis, crassis, plus minusve hispidis.

This perennial rhizomatous variety has thick leaf blades varying from ovate-lanceolate to linear-lanceolate in shape. The herbage is sub-glabrous, but it has a varying amount of stiff, more or less divergent trichomes about 1 mm. long, at least on the flower buds or the margins of the leaves. It is found in sandy areas of the prairie and plains region. It has been passing as *P. lanceolata*, but that name was given to seemingly aberrant plants of the eastern United States which may very well be intergrades between *P. heterophylla* and *P. virginiana*.

The TYPE is *Waterfall* 7308, sand dunes, 1 mile east of Mangum, Greer Co., Oklahoma, June 28, 1947, in the Herbarium of Oklahoma State University; isotypes (TEX, OKL).

It usually grows in sandy situations, but is found also on dry hilltops, edges of fields and other disturbed areas, primarily in Oklahoma, Kansas, Nebraska and eastern Colorado; flowering in May, June and July.

Selected from 212 sheets of 147 collectors: COLORADO: Baca Co.: Rogers 6436 (COLO); Boulder Co.: Ramaley 11624 (COLO); Denver Co.: Eastwood 23 (COLO, GH, UC); El Paso Co.: Williamson July 10, 1901 (PH); Fremont Co.: Brandegee 392 (NY, PH, UC); Jefferson Co.: Greene 323 (GH); Larimer Co.: Smith July 15, 1944 (UC); Las Animas Co.: Rogers 6003 (COLO); Lincoln Co.: Ownbey 1318 (COLO, GH, NY, UC); Phillips Co.: Weber 5040 (COLO); Weld Co.: Ramaley 15138 (ARIZ, COLO, OKL, TEX, UC); Yuma Co.: Harrington 5036 (COLO); INDIANA: Lake Co.: Bebb 499 (OKL); Tippecanoe Co.: Ek June 10, 1942 (GH, NY, TEX, UC); KANSAS: Barton Co.: Rydberg and Imler 1330 (KANU, NY); Cheyenne Co.: McGregor 9433 (KANU); Clark Co.: Rydberg and Imler 768 (KANU); Clay Co.: Kellerman July 2, 1888 (GH); Comanche Co.: Rydberg and Imler 1109 (KANU, NY); Finney Co.: Rydberg and Imler 996 (KANU, NY); Grove Co.: Hitchcock 572 (GH); Hamilton Co.: Wilson and Miller (KANU); Meade Co.: Horr and McGregor 3841 (KANU); Reno Co.: Rydberg and Imler 563 (KANU, NY); Riley Co.: Norton 368 (GH, NY); Rooks Co.: Horr 5005 (KANU); Sedgwick Co.: Coll. unknown Aug. 20, 1933 (KANU); Wyandotte Co.: Mackenzie 1159 (NY); MINNESOTA: Isanti Co.: Rosendahl and Butters 5051 (GH); MISSOURI: Jackson Co.: Bush 4970 (GH, NY, OKL); Johnson Co.: Stevens 4166 (NY); Nebraska: Banner Co.: Rydberg 473 (NY); Cherry Co.: Tolstead 550 (GH); Custer Co.: Bates June 15, 1901 (GH); Hapeman June 7, 1928 (DUKE); Lincoln Co.: Porter 2059 (GH, OKL); NEW MEXICO: Santa Fe Co.: Tracy and Evans 110 (NY); OKLAHOMA: Beckham Co.: Pennell 10556 (NY, PH); Beaver Co.: Goodman 5332 (OKL, TEX); Blaine Co.: Waterfall 7070 (OKL, OKLA, TEX); Cleveland Co.: Little 396 (OKL); Custer Co.: Mericle 318, 328, 703, 1866 (OKL); Ellis Co.: Waterfall 11891 (OKLA); Garvin Co.: Andrews 97 (OKL); Grady Co.: McFarland 15 (OKL); Greer Co.: Bull 219 (OKL); Harper Co.: Stevens 3322 (GH, NY, OKL); Jackson Co.: Stevens 1176 (GH, OKL); Kay Co.: Stevens 1919 (GH); Kingfisher Co.: Byers 211 (OKLA); Logan Co.: Goodman 2126 (GH, OKL); Oklahoma Co.: Waterfall 2350 (GH, NY); Payne Co.: Abernathy 32 (OKLA); Pushmataha Co.: Waterfall 11397 (OKLA); Roger Mills Co.: Smith 607 (OKLA); Texas Co.: Waterfall 7961 (OKL, OKLA); Woods Co.: Waterfall 7857 (OKL, OKLA); Woodward Co.: Nelson and Goodman 5301 (OKL); South Dakota: Meyer Co.: Wallace (NY); TEXAS: Collingsworth Co.: Cory 16151 (GH); Hall Co.: Reverchon 4311 (GH); Hemphill Co.: Cory 16236 (GH); Wichita Co.: Tharp 535 (NY, TEX); UTAH: Sanpete Co.: Ward 676 (GH); WYOMING: Albany Co.: Nelson 7358 (GH, NY);

Converse Co.: Nelson 8366 (GH); Platte Co.: Porter 4894 (COLO, GH, OKL, PH, TEX, UC).

9f. **P. virginiana** Miller, var. **polyphylla** (Greene) Waterfall, comb. et stat. nov., based on *Physalis polyphylla* Greene, Pittonia 4: 150–151. 1900.

Plants simple or branched near the base, nearly glabrous, the few hairs short and antrorse; longer leaves mostly 3–5 cm. long, lanceolate or linear-lanceolate.

TYPE: C. F. Baker 576 Piedra, southern Colorado, July 12, 1899 (isotypes: GH, NY, UC).

The only other collection seen is Waterfall 11115, collected on a shale hillside, opening in pine forest 12 miles west of Chama, Rio Arribo Co., New Mexico, Aug. 25, 1952. (OKLA).

9g. **P. virginiana** Miller, var. **campaniforma** Waterfall, var. nov., caulis parvis, curtis retrorsum-pilosus; foliis ovatis; corollis maculatis; calycis campaniformis, ad basin 4–5 mm. latis, ad apices 1.5–2 cm. latis.

This variety is characterized by the combination of ovate leaves, short retrorse hairs and campanulate calyx, 4–5 mm. wide at its base, and 1.5–2 cm. wide at the tips of its divergent lobes.

TYPE: P. C. Standley 4556. Mouth of Indian Creek, altitude 8000 ft.; in Pecos National Forest, New Mexico, July 25, 1908. Two sheets are in the Herbarium of the New York Botanical Garden. At present this distinctive variety is known only from the type collection.

10. **Physalis hederaefolia** Gray, Proc. Amer. Acad. Arts and Sciences 10: 65. 1875.

Plants erect or spreading from a perennial base, simple or many-stemmed; herbage with a mixture of long jointed hairs and short trichomes, or with short hairs only, which may be viscid or not, glandular or not, antrorse or spreading; leaf blades subreniform to ovate, or rarely ovate-lanceolate; corollas 10–15 mm. long, yellow or yellowish green, usually darker on the base of the limb, but sometimes obscurely so; limb of the corolla often reflexed when fully open; anthers usually yellow, 1.5–4 mm. long; flowering calyx about one-half as long as the corolla, on peduncles usually 3–8 mm. long; fruiting calyx 2–3 cm. long and 1.5–2.5 cm. wide on peduncles 1–2 cm. long.

10a. **P. hederaefolia** Gray, var. **hederaefolia** *P. hederaefolia* Gray, var. *puberula* Gray, loc. cit. supra; *P. Palmeri* Gray, Synoptic Flora 2 (1): 235. 1888.

Herbage vestite with one or some combination of long jointed hairs, short di-variate or retrorse hairs, or glandular hairs; leaf blades subreniform to ovate; calyces at anthesis usually 3–4 mm. wide; anthers mostly 3–4 mm. long, yellow

TYPE: Charles Wright 528, in part, Turkey Creek, western Texas to El Paso, Oct. 1849 (GH). It has a few long hairs, a few short hairs and a few sessile, or subsessile spherical glands; the type of var. *puberula* has many short hairs on the stems, and short hairs and a few spherical sessile glands on the leaves.

Variety *hederaefolia* grows in desert plains, desert scrub, canyons, mountains and valleys, primarily in southwestern Texas, New Mexico and adjacent Arizona; it flowers in May, June and July, sometimes in August, September and October.

Selected from 243 sheets of 180 specimens: ARIZONA: Cochise Co.: *Harrison* 8259 (ARIZ); Coconino Co.: *Hanson* 133A (COLO, TEX); Gila Co.: *Gould* and *Hudson* 3742 (ARIZ, GH, UC); Pima Co.: *Gould* 3952 (ARIZ); Pima Co.: *Toumey* 404 (ARIZ); Yavapai Co.: *Wolf* 2311 (GH); CALIFORNIA: San Bernardino Co.: *Wolf* 10772 (UC); San Diego Co.: *Abrams* 3703 (GH); NEVADA: Clark Co.: *Clokey* 8107 (GH, NY); Lincoln Co.: *Ripley* and *Barneby* 6405 (NY); NEW MEXICO: Bernalillo Co.: *Koelz* June 28, 1926 (MICH); Dona Ana Co.: *Wooton* 136 (NY); Grant Co.: *Greene* Sept. 31, 1880 (NY); Lincoln Co.: *Wooton* 634 (NY); San Miguel Co.: *Rose* and *Fitch* 17606 (NY); TEXAS: *Cory* 16628 (GH); Bandera Co.: *Palmer* 12253 (TEX); Brewster Co.: *Mueller* 8154 (GH, MICH, NY, TEX, UC); *Warnock* 341 (GH, NY, TEX); Burnet Co.: *Rogers*, *Albers* and *Barksdale* 6864 (OKLA, TEX); Cameron Co.: *Chandler* 7064 (GH, NY, UC); Culberson Co.: *Waterfall* 4059 (GH, NY); Duval Co.: *Croft* 11 (MICH, NY); El Paso Co.: *Warnock* 4100 (TEX); Gonzales Co.: *Smith* and *LeSueur* 42-42 (GH, TEX); Grimes Co.: *Tharp* April 11, 1936 (TEX); Hidalgo Co.: *LeSueur* 442 (TEX); Hudspeth Co.: *Waterfall* 4875 (GH, NY); Jeff Davis Co.: *Palmer* 31935 (TEX); Kenedy Co.: *Cory* 28408 (GH); Leon Co.: *Cory* 21810 (GH); Mason Co.: *Whitehouse* Sept. 1, 1929 (TEX); McLennan Co.: *Smith* 620 (TEX); Maverick Co.: *Pringle* 8324 (GH, NY, UC); Pecos Co.: *Tharp* 256 (OKL, UC); Presidio Co.: *Hinckley* 2753 (GH); Real Co.: *Cory* 42778 (GH); Reeves Co.: *Tracy* and *Earle* 126 (GH, NY, TEX); Smith Co.: *Cory* 25881 (GH); Taylor Co.: *Cory* 7393 (MICH, UC); Terrell Co.: *Webster* 190 (TEX); Tom Green Co.: *Reverchon* 3922 (GH); Travis Co.: *Tharp* Aug. 18, 1941 (GH, TEX); Upton Co.: *Cory* 53482 (GH); Webb Co.: *Mackenzie* 86 (NY); UTAH: Kane Co.: *Boyle* 208 (UC); Millard Co.: *Garrett* 2969 (NY).

10b. *P. hederaefolia* Gray, var. *comata* (Rydberg) Waterfall, RHODORA 52: 171. 1950; *P. comata* Rydb., Bull. Torr. Bot. Club 22: 306. 1895; including *P. rotundata* Rydb., Mem. Torr. Bot. Club 4: 352. 1896.

Herbage with long jointed hairs more or less abundantly mixed with shorter hairs, which may, or may not, be viscid or glandular; flowering calyx 8–11 mm. wide; leaf blades ovate to rotund, toothed to nearly entire.

TYPE: *P. A. Rydberg* 269, under the cliffs, south side of Scott's Bluff, Nebraska, July 20, 1891, in the Herbarium of the New York Botanical Garden.

Variety *comata* is found on plains, mountains slopes, dry hills, gravel banks and sandhills, principally in western Nebraska, western Kansas and eastern Colorado; it usually flowers in June, July, August and September.

Selected from 80 sheets of 63 collections: COLORADO: Bent Co.: *Osterhout* 4118 (NY); Boulder Co.: *Ewan* 12258 (UC); Cheyenne Co.: *Ownbey* 1357 (COLO, GH, NY); Denver Co.: *Eastwood* Sept. 10, 1910 (GH, UC); El Paso Co.: *Ehlers* 7764 (ARIZ, GH); Fremont Co.: *Ewan* 14248 (COLO); Larimer Co.: *Nelson* Aug. 31, 1900 (NY); Las Animas Co.: *Rogers* 4843 (COLO); Weld Co.: *Osterhout* 2309 (NY); KANSAS: Barber Co.: *Rydberg* and *Imler* July 5, 1929 (NY); Cheyenne Co.: *McGregor* 9425 (KANU); Ellis Co.: *Rydberg* and *Imler* 1228 (KANU, NY); Finney Co.: *Wilson* and *Miller* July 22, 1912 (KANU); Kiowa Co.: *Hitchcock* 774 (GH, NY); Osborne Co.: *Shear* 221 (GH, NY); Riley Co.: *Gates* 14537 (MICH); Rooks Co.: *Bates* 4563 (GH); NEBRASKA: Adams Co.: *Bates* 4607 (GH); *Rydberg* Aug 8, 1891 (NY); Buffalo Co.: *Bates* 4903 (GH); Custer Co.: *Bates* 2403 (GH); Garfield Co.: *Bates* 4634 (NY); Lincoln Co.: *Rydberg* Sept. 1895 (UC); Webster Co.: *Bates* July 3, 1907 (NY); NEW MEXICO: Lincoln Co.: *Skehan* July 7, 1898 (GH, NY, UC); OKLAHOMA: Cimarron Co.: *Waterfall* 7902, 9122, 9240 (OKL, OKLA); Texas Co.: *Waterfall* 7867 (OKL, OKLA, TEX); Woods Co.: *Ward* 54 (NY); SOUTH DAKOTA: Lawrence Co.: *Bennett* 3259 (UARK).

10c. **P. hederaefolia** Gray, var. **cordifolia** (Gray) Waterfall, comb. nov., based on *P. Fendleri* Gray, var. *cordifolia* Gray, Synop. Flora N. Amer. 2(1): 395. 1878. *P. Fendleri* Gray, Proc. Amer. Acad. Arts and Sciences 10: 66. 1875.

Indument of short reflexed hairs with many to few short, somewhat flattened branched hairs, which are sometimes present only on the calyx; leaf blades ovate to ovate-lanceolate (2) 3–6 cm. long and 1–3 cm. wide, from (1.2) 1.4–2.5 times longer than wide.

TYPE: The type of *P. Fendleri* is *Fendler 683*, New Mexico (GH). That of var. *cordifolia* is *Palmer 363*, St. George, southern Utah (GH).

This taxon grows in mountains, canyons, mesas, plains, in juniper-pinson pine areas, and in disturbed habitats, principally in southwestern Texas; it flowers mostly in July, August and September.

Selected from 196 sheets of 146 collections: ARIZONA: Apache Co.: *Goodman* and *Payson 3167* (GH, NY); Cochise Co.: *Blumer 2104* (ARIZ, GH, NY); Coconino Co.: *Thornber 2088* (ARIZ); Gila Co.: *Parker, McClintock and Robbins 6125* (ARIZ); Maricopa Co.: *Rusby 775* (MICH, NY); Mohave Co.: *Kearney and Peebles 12761* (ARIZ); Navajo Co.: *Jones 1109* (ARIZ); Pima Co.: *Parker, McClintock and Haskell 5885* (ARIZ, UC); Santa Cruz Co.: *Peebles and Loomis 7019* (ARIZ); Yavapai Co.: *Kearney and Peebles 9719* (ARIZ); CALIFORNIA: San Bernardino Co.: *Wolf 10722* (NY, UC); San Diego Co.: *Palmer 1875* (GH); COLORADO: Archuleta Co.: *Weber and Livingston 6254* (COLO); El Paso Co.: *McCosh and Greene 1877* (NY); Fremont Co.: *Waterfall 11503* (OKLA, TEX); Huerfano Co.: *Ramaley 16236* (COLO); La Plata Co.: *Jones 503* (MICH); Las Animas Co.: *Rogers 5416* (COLO); Mesa Co.: *Rollins 1915* (GH, NY); Montezuma Co.: *Baker, Earle and Tracy 823* (NY); Montrose Co.: *Payson 3927* (GH); Otero Co.: *Paull 87* (COLO); Pueblo Co.: *Pammel Aug. 24, 1913* (GH, TEX); NEVADA: Clark Co.: *Train 2003* (ARIZ); *Clokey 8204* (ARIZ, DUKE, NY, OKL, OKLA, TEX); NEW MEXICO: Colfax Co.: *Standley 14012* (NY); Dona Ana Co.: *Wooton and Standley 3157* (ARIZ, NY); Grant Co.: *Blumer 49* (GH, NY); Luna Co.: *Shreve 8343* (ARIZ); Otero Co.: *Schulz 297* (GH); San Miguel Co.: *Standley 4945* (GH, NY); Santa Fe Co.: *Robbins 8244* (COLO); Sierra Co.: *Metcalfe 945* (GH, NY); Taos Co.: *Wooton 2693* (NY); Torrance Co.: *Parker and McClintock 6526* (ARIZ); Valencie Co.: *Vogt 27* (ARIZ); Oklahoma: Cimarron Co.: *Waterfall 7915* (OKL, OKLA); TEXAS: Brewster Co.: *Marsh 261* (GH); El Paso Co.: *Lee, Berkman and Tharp 46192* (TEX); Hudspeth Co.: *Waterfall 6694* (GH); Jeff Davis Co.: *Hinckley 574* (NY); UTAH: Piute Co.: *Tidestrom 2942* (MICH); San Juan Co.: *Rydberg and Garrett 9390* (NY); Washington Co.: *Gould 2028* (ARIZ, COLO, GH, NY).

11. **Physalis caudella** Standley, Field Mus. Publ. Bot. 17: 273. 1937.

Plants simple or branched, apparently from a deep rhizome which is not collected; indument usually villous, of long jointed hairs (1) 2–3 mm. long, dense or sparse, or of long and short hairs intermixed in varying proportions; leaf blades 4–7 cm. long and 1.5–4 cm. wide, usually lanceolate, rarely ovate-lanceolate or linear-lanceolate, on petioles 0.5–2 cm. long (this amount of variation in length of petioles may be found in the same plant, with the longer petioles below and the shorter ones above); margins of the leaf blades entire to irregularly undulate to saliently few-toothed; corollas 14–18 mm. long, yellow, with prominent deep reddish-blue or purplish spots on the limb; anthers blue or blue-green, about 3 mm. long, on slender filaments much

narrower than the anthers; calyx 7–10 mm. long, its lobes 3–8 mm. long; flowering peduncles usually about 5 mm. long, sometimes as much as 8 mm. long; fruiting calyx (2.5) 3–5 cm. long and (2) 2.5–3 cm. wide, with calyx lobes (6) 10–15 (17) mm. long.

TYPE: *Howard Scott Gentry 2710*, on oak-pine slope, 2,160 meters elevation, Cajurichi, Rio Mayo, Chihuahua, Mexico, Sept. 13, 1936 (f). An isotype is at UC. The isotype has lobes of the flowering calyx 3–8 mm. long, and a calyx cup only about 2 mm. long; the fruiting calyx also has lobes at the extreme limit of length, being 14–17 mm. long. One of the Arizona specimens approaches the type, having a flowering calyx with lobes 7 mm. long and a calyx tube 3 mm. long. However most of them have calyx lobes somewhat shorter than the calyx tube; the lobes of the fruiting calyx in the Arizona material are usually 10–15 mm. long, rarely as short as 6 mm.

Habitat, range and flowering time: Growing in canyons, pine woods and oak woods in the mountains of southern Arizona (with one collection from southwestern New Mexico) and adjacent Sonora and Chihuahua; flowering in June, July and August.

Selected from 31 sheets of 19 collections: Arizona: Cochise Co.: *Benson 10448* (ARIZ, NY, UC); *Gooding 843* (ARIZ, GH, NY); Pima Co.: *Kearney and Peebles 10504* (ARIZ, UC); Santa Cruz Co.: *Parker 7683* (ARIZ, COLO, NY, UC); NEW MEXICO: Socorro Co.: *Wooton Aug. 6, 1900* (NY).

**12. *Physalis crassifolia* Bentham, Botany of the Voyage of the Sulphur 40. 1844.**

Stems usually several from a ligneous base, each stem branched, sometimes several times; herbage minutely puberulent, sometimes slightly glandular; principal leaf blades (1.5) 2–3 (5) cm. long, and (1.5) 2–2.5 (3.5) cm. wide, usually broadly ovate; leaf margins entire to sinuately or repandly few-toothed to dentate; petioles two-thirds the length of the blade to equalling it; corolla yellow, sometimes becoming bluish in age, or when dried and pressed, 10–15 mm. long, its limb reflexed when fully open; anthers yellow, 2.5–3 mm. long; filaments having a few long hairs growing on them; calyx at anthesis usually 3–6 mm. long on peduncles 5–10 times their length; fruiting calyx usually 2–3 cm. long and 1.5–2 cm. wide.

**12a. *P. crassifolia* Bentham, var. *crassifolia*.** *P. cardiophylla* Torrey, Bot. Mex. Bound. 153. 1859; *P. crassifolia* var. *cardiophylla* (Torr.) Gray, Synoptic Flora 2(1): 235. 1878; *P. muriculata* Greene, Bull. Calif. Acad. 1: 209. 1885.

Leaves thick, entire to sinuately or repandly few-toothed; flowering calyx usually 4–6 mm. long on peduncles 6–7 times their length; corollas yellow, sometimes with brownish centers.

TYPE: Bay of Magdalena, Lower California, Mexico; not seen.

Variety *crassifolia* grows on deserts, canyon floors, rocky hillsides, and mountains, principally in Arizona, and California; it flowers from March through October.

Selected from 185 sheets of 157 collections: ARIZONA: Cochise Co.: *Blumer 90* (ARIZ); Mohave Co.: *Harrison, Kearney and Fulton 7549* (ARIZ); Pima Co.: *Harrison and Kearney 7238* (NY); Pinal Co.: *Gillespie 8919* (NY, UC); Yavapai

Co.: Peebles, Harrison and Kearney 7431 (NY); Yuma Co.: Benson 10807 (ARIZ); CALIFORNIA: Imperial Co.: Rose 36830 (OKL, MICH); Inyo Co.: Clokey and Templeton 5776 (NY, UC); Kern Co.: Munz, Johnston and Harwood 4034 (NY); Riverside Co.: Clokey 6881 (NY, UC); Mason 4185 (GH, UC), Rose 36001 (GH, UC); San Bernardino Co.: Munz 11720 (ARIZ, COLO, NY); San Diego Co.: Abrams 3160 (GH, NY); NEVADA: Clark Co.: Clokey 8577 (COLO, NY, UC); Clover 8235 (MICH); Lincoln Co.: Kennedy and Gooding 10 (ARIZ, NY, UC).

12b. **P. crassifolia** Bentham, var. **versicolor** (Rydberg) Waterfall, comb. et stat. nov., based on *P. versicolor* Rydb. Bull. Torr. Bot. Club **22**: 307. 1895; *P. genucaulis* Aven Nelson, Bot. Gaz. **47**: 430. 1909.

Leaves thinner, usually dentate, but sometimes nearly entire; calyx usually 3–4 mm. long on peduncles 5–10 times their length; corolla yellow, usually some, or all, of them turning bluish in drying.

TYPE: Rydberg selected no type, therefore *Edward Palmer* 622, collected at Guaymas, Mexico in 1887 is selected as the LECTOTYPE (NY); isolectotype (GH).

Its habitat, distribution and flowering time are apparently similar to the above, but it is not so widespread.

Selected from 71 sheets of 55 collections: ARIZONA: Gila Co.: King and Belden 2439 (ARIZ); Mohave Co.: (?) : Clover 6009 (ARIZ); Pima Co.: Toumey June 1, 1896 (GH, NY), Gould and Macbride 4128 (ARIZ, GH, NY, UC); Pinal Co.: Thornber 5517 (ARIZ, NY); Yuma Co.: Parker, Parker, Wright and Lowe 7816 (COLO, NY, UC); CALIFORNIA: Imperial Co.: Wiggins 9606 (GH, UC); Riverside Co.: Wiggins 9673 (GH, NY, UC); Nevada: Clarke Co.: Train 1366 (NY, UC).

13. **Physalis ixocarpa** Brotero ex Hornemann, Hortus Regius Botanicus Hafniensis, Supplement 26. 1819; *P. aequata* Jacq. f. ex Nees, Linnaea **6**: 470. 1831.

Annual, 15–60 cm. tall, branched, glabrous to rather sparsely vestite with short appressed hairs; leaf blades 2–7 cm. long, ovate to ovate-lanceolate; margins of the leaves dentate to sinuate-dentate to entire, on petioles about one-half as long as the blade to equalling it in length; corolla 7–15 mm. long, with 5 bluish-tinged dark spots on its limb which is recurved when fully open; anthers blue, about 3 mm. long, strongly twisted after dehiscence; flowering peduncles 3–5 mm. long; fruiting calyx usually 2–2.5 (3) cm. long, nearly globose, often well-filled with the fruit; fruiting peduncles usually 3–8 mm. long.

Fruiting material may often resemble *P. virginiana* var. *subglabrata*. It can be distinguished by its shorter peduncles.

TYPE: None was selected by Hornemann, and no material was cited. Presumably a neotype should be selected, probably from Mexican collections since the species seems to be native there. However the author prefers to defer this action until a more detailed study of the species from that area may be accomplished. The concept of the species is based upon the material cited later, which seems to be conspecific with Mexican material seen.

This species is cultivated and escapes; it flowers through much of its growing season.

Selected from 95 sheets of 81 collections: CANADA: Ottawa, Marie-Victorin, et al. 43923 (GH); UNITED STATES: CALIFORNIA: Butte Co.: Yates 6127

(uc); Fresno Co.: *Bacigalupi*, Ferris and Wiggins 2491 (GH, NY, uc); Los Angeles Co.: Fosberg 53036 (GH, NY); Riverside Co.: Conger Oct. 1909 (uc); San Bernardino Co.: Parish Sept. 1888 (uc); San Luis Obispo Co.: Mirossi Aug. 5, 1840 (uc); Santa Barbara Co.: Bingham 29 (NY); Ventura Co.: Pollard Oct. 27, 1945 (COLO); DELAWARE: New Castle Co.: Commons Nov. 2, 1898 (GH); Sussex Co.: Churchill Sept. 11, 1908; Illinois: Adams Co.: Seymour Aug. 1878 (DUKE); DuPage Co.: Moffett 3197 (GH, OKLA); Fulton Co.: Vasey 1862 (GH); MARYLAND: McVaugh 134543, cult., originally from Mexico (MICH); MASSACHUSETTS: Middlesex Co.: Deane Sept. 24, 1884 (NEBC); Norfolk Co.: Fernald Sept. 26, 1908 (GH); MICHIGAN: Emmet Co.: Hoover 1943, seeds from the Orange Free State (DUKE, TEX, UC); MINNESOTA: Herb. Canby Sept. 1868 (NY); NEW JERSEY: Hunterdon Co.: Dodge July 18, 1899 (MICH); NEW MEXICO: Rio Arriba Co.: Wooton 2697 (NY); Santa Fe Co.: Fendler 680 (GH); NEW YORK: Ontario Co.: coll. unknown Aug. 2, 1887, raised from seeds from Palmer from Mexico (GH); Tompkins Co.: Hoisington 340, cultivated (OKLA); OREGON: Multnomah Co.: Nelson 3325 (GH); PENNSYLVANIA: Fretz 1881 (uc); Philadelphia Co.: Parker Sept. 9, 1874 (NY); TEXAS: Bexar Co.: Jermy 1904 (NY); Brewster Co.: Marsh 163 (GH); Crockett Co.: Cory 29703 (GH); Refugio Co.: Tharp Sept. 7, 1929 (MICH); Webb Co.: Mackenzie 85 (NY); VERMONT: Chittenden Co.: Flynn 4 (GH); VIRGINIA: Clarke Co.: Young 485, raised in experimental plots (TEX); WASHINGTON: Klickitat Co.: Suksdorf 2284 (GH, uc); Washington D. C.: Steele Sept. 20, 1899 (DUKE); WEST VIRGINIA: Rawleigh Co.: Tosh 650 (uc).

**14. *Physalis Wrightii* Gray, Proc. Amer. Acad. Arts and Sciences 10: 63. 1875.**

Annual 30–90 cm. tall, nearly glabrous, the few hairs short, stiff and appressed; leaf blades ovate-lanceolate to linear-lanceolate, the principal ones usually 4–12 centimeters long on petioles 1.5–7 cm. long; leaf margins usually irregularly and often coarsely dentate, sometimes regularly and saliently dentate; corolla a light yellow color, sometimes with a greenish tinge, rotate with very little tube, 15–23 mm. wide when fully open, with five hairy pads on its limb near the base, alternating with the stamens; anthers (2.8)3 (3.8) mm. long, yellow with a blue or blue-green tinge; filaments slender, somewhat exceeding the anthers in length; flowering calyx usually 4–5 mm. long on peduncles 5–12 times its length; fruiting calyx usually 2–2.5 cm. long and 1.7–2 cm. wide, on peduncles usually 2.5–6 cm. long, sometimes nearly filled by the fruit.

TYPE: Charles Wright 1602, prairies along the San Pedro River, southwestern Texas, 1851–52 (GH); isotype (NY); no other collections have been seen from Texas.

Habitat, distribution and flowering time: Growing in deserts and mountains, but particularly in fields and other disturbed habitats, primarily in Arizona and California; flowering from July to November.

Selected from 46 sheets of collections: ARIZONA: Cochise Co.: Griffiths 1579 (ARIZ, NY); Gila Co.: Collom Sept. 15, 1934 (MICH); Graham Co.: Richardson 437 (ARIZ); Maricopa Co.: Wiggins 3860 (MICH); Navajo Co.: Zuch 49 (ARIZ); Pima Co.: Pringle Aug. 1, 1894 (GH, NY); Gould 3938 (ARIZ, TEX, UC); Pinal Co.: Arnold and Darrow Sept. 13, 1936 (GH, UC); Yuma Co.: Thornber Sept. 24, 1912 (ARIZ); CALIFORNIA: Imperial Co.: Munz 11523 (NY); Kern Co.: Yates 6839 (UC); Los Angeles Co.: Wheeler 964 (UC); San Diego Co.: Brandegee July 1895 (UC); TEXAS: Wright 1602. (GH, NY).

15. **Physalis angulata** Linnaeus, Species Plantarum 1: 183. 1753; other synonymy under the varieties.

Annual, 15–90 cm. tall, glabrous, or with a few short appressed hairs especially on the younger parts; blades of principal leaves usually 4–10 cm. long, ovate to lanceolate, or sometimes linear-lanceolate; margins of the leaves irregularly and sometimes coarsely or saliently toothed, or entire, on petioles 1–4 cm. long; corolla yellowish, not dark spotted, usually 4–10 mm. long; anthers usually 1–2.3 mm. long, bluish, on slender filaments; flowering calyx usually 3–5 mm. long with calyx lobes 1–2.5 mm. long; flowering peduncles 5–40 mm. long; fruiting calyx usually 2–3 cm. long and 1.5–2.5 cm. wide on peduncles 10–40 mm. long.

15a. **P. angulata** L., var. **angulata**. *P. Linkiana* Nees, Linnaea 6: 471–472. 1831; *P. angulata* L., var. *Linkiana* (Nees) Gray, Proc. Amer. Acad. Arts and Sciences 10: 64. 1875.

Leaves ovate to ovate-lanceolate; corolla usually 6–10 mm. long; flowering calyx usually 4–5 mm. long with calyx lobes 2–2.5 mm. long; flowering peduncles usually 5–15 mm. long; fruiting calyx on peduncles usually 20–30 mm. long, shorter than to equalling the length of the fruiting calyx.

Variety *angulata* grows in open woods, pastures, ditches, fields, and various disturbed habitats in the extreme eastern states, and in the southeastern states as far west as eastern Oklahoma and Texas; it flowers from May to September.

Selected from 104 sheets of 77 collections: ALABAMA: Coosa Co.: *Pollard* and *Ball* 263 (GH, NY); Lee Co.: *Earle* and *Baker* Aug. 11, 1897 (NY); Tuscaloosa Co.: *Pollard* and *Maxon* 330 (MICH, NY); ARKANSAS: Arkansas Co.: *Moore* 32748 (OKLA, UARK); Ashley Co.: *Demaree* 16362 (NY); Chicot Co.: *Demaree* 18567 (ARIZ, NY); Hempstead Co.: *Buckholz* 388 (UARK); Jefferson Co.: *Demaree* 13987 (NY); Pulaski Co.: *Merrill* 672 (UARK); CONNECTICUT: Hartford Co.: *Bissell* Aug. 19, 1904 (GH); DELAWARE: *Commons* Aug. 15, 1877; FLORIDA: Collier Co.: *Moldenke* 5761 (NY); Columbia Co.: *Straub* 36 (GH); Duval Co.: *Curtiss* 5737 (GH, NY, UC); Gadsden Co.: *Berg* (NY); Gulf Co.: *Chapman* 4345 (GH, NY); Hillsborough Co.: *Deam* 2746 (GH); Lake Co.: *Nash* 1052 (GH, MICH, UC); Lee Co.: *Hitchcock* 238 (GH, NY); Leon Co.: *Godfrey* 52385 (DUKE); Pinellas Co.: *Deam* 2905 (GH); Polk Co.: *McFarlin* 6569 (MICH); Volusia Co.: *Hood* 9 (GH); GEORGIA: Decatur Co.: *Thorne* 4629 (GH); De Kalb Co.: *Small* Sept. 11, 1894 (NY); McDuffie Co.: *Bartlett* 1662 (MICH); LOUISIANA: Baton Rouge Parish: *Chamblis* 17 (NY); Correll 9567 (DUKE, GH, NY); Tangipahoa Parish: *Correll* 9240 (DUKE); MISSISSIPPI: Harrison Co.: *Tracy* 6476 (GH, NY); Jackson Co.: *Pollard* 1123 (GH, NY); NEW JERSEY: Brunswick Co.: *Godfrey* 10083 (TEX); Camden Co.: *Beringer* Sept. 1891 (MICH); NORTH CAROLINA: Moore Co.: *Oosting* 34777 (DUKE, PH); New Hanover Co.: *Williamson* Sept. 1, 1900 (NY, PH); Wilson Co.: *Randolph* and *Randolph* July 7, 1922 (GH); OKLAHOMA: Delaware Co.: *Wallis* 2728 (OKLA); Oklahoma Co.: *Waterfall* 2349 (OKL); Pottawatomie Co.: *Barkley* 395 (OKL); SOUTH CAROLINA: Charleston Co.: *Moldenke* 5196 (NY); in cultis *Curtis* (GH); TEXAS: Angelina Co.: *Cory* 10665 (GH); Brazos Co.: *Parks* Dec. 1, 1946 (TEX); Gonzales Co.: *Tharp* Nov. 23, 1935 (MICH); Harris Co.: *Boon* 481 (TEX); Houston Co.: *Cory* 26121 (GH); Jefferson Co.: *Tharp* Sept. 9, 1937 (TEX); Wood Co.: *Cory* 57671 (COLO); VIRGINIA: Princess Anne Co.: *Fernald* and *Long* 10881 (GH); Southampton Co.: *Fernald* and *Long* 13742 (GH).

15b. *P. angulata* L., var. *pendula* (Rydberg) Waterfall, comb. et stat. nov., based on *P. pendula* Rydb. in Small, Flora of the Southeastern United States 983. 1903.

Similar to var. *angulata*, but leaves sometimes narrower; flowering calyx usually 3 mm. long, sometimes 4 mm. long; with calyx lobes about 1 mm. long; flowering peduncles usually 15–40 mm. long; fruiting peduncles usually 20–40 mm. long, equalling the fruiting calyx (which is usually 20–25 mm. long) to three times its length.

TYPE: In describing this species, Rydberg did not select a type, stating that it was the taxon that he had originally called *P. lanceifolia*, or at least the part of it occurring from Illinois to Texas. He cited several collections in his treatment of the genus (1896), and from among these *F. L. Harvey* 65 "central and southern Arkansas" (UARK) is selected as LECTOTYPE.

This variety grows in river valleys, bottom woods, fields and various disturbed sites, primarily in Oklahoma and Texas, but extending north to Illinois; it flowers from June through September.

Selected from 125 sheets of 104 collections: ARKANSAS: Conway Co.: *Moore* 420449 (UARK); Garland Co.: *Demaree* 20471 (NY, UC); *Harvey* 65 (MICH); Little River Co.: *Moore* 510682 (UARK); Prairie Co.: *Demaree* 15498 (NY); Pulaski Co.: *Merill* 725 (UARK); ILLINOIS: Alexander Co.: *Palmer* 16628 (PH); Cook Co.: *Umbach* Aug. 3, 1897 (MICH, NY, PH); St. Claire Co.: *Eggert* Sept. 16, 1893 (GH); Union Co.: *Vasey* 1862 (GH); *Vasey* (NY); KANSAS: Douglas Co.: *McGregor* 607 (KANU); Geary Co.: *Hitchcock* 775 (GH, NY); Linn Co.: *Rydberg* and *Imler* 77 (NY); Miami Co.: *McGregor* 11048 (KANU); Sedgwick Co.: *Horr* 6191.1 (KANU); LOUISIANA: *Hale* (GH); MASSACHUSETTS: Middlesex Co.: *Perkins* Oct. 22, 1880 (NY); MISSOURI: Jackson Co.: *Mackenzie* May 10, 1896 (NY); Jasper Co.: *Palmer* 3093 (NY); St. Louis Co.: *Eggert* Sept. 7, 1887 (PH, UC); *Engelmann* 324 (GH); OKLAHOMA: Alfalfa Co.: *Waterfall* 9970 (OKLA); Blaine Co.: *Waterfall* 2387 (OKL, UC); Cherokee Co.: *Wallis* 1468, 1891 (OKLA); Creek Co.: *Bush* 397 (GH); Custer Co.: *Palmer* 12555 (TEX, UC); Garvin Co.: *Andrews* 133 (OKL); Logan Co.: *Smith* 889 (OKL); Murray Co.: *Robbins* 2729 (OKL); Muskogee Co.: *Little* 188 (OKL); Oklahoma Co.: *Waterfall* 2091 (OKLA, GH); Osage Co.: *Stevens* 2115 (GH, NY, OKL, OKLA); Payne Co.: *Coryell* 388, 596 (OKLA); Pittsburg Co.: *McClary* 66 (OKL); Pontotoc Co.: *McCoy* 852, 1267, 1915 (OKLA); Pottawatomie Co.: *Van Vleet* July 12, 1905 (OKL); TEXAS: Bexar Co.: *Metz* 64 (NY, UC); Bowie Co.: *Plank* May 9, 1891 (NY); Brazos Co.: *Reeves* 62 (GH); Calhoun Co.: *Gentry* 49 (TEX, LIL); Colorado Co.: *Bush* 333 (GH, NY); Dallas Co.: *Hall* 504 (GH, NY); DeWitt Co.: *Riedel* Aug. 3, 1941 (TEX); Harris Co.: *Boon* June 22, 1943 (TEX); Jackson Co.: *Tharp* Aug. 8, 1941 (TEX); Lamar Co.: *Strandtman* 10 (TEX); McLennan Co.: *York* 46232 (OKL, TEX); Refugio Co.: *Tharp* Dec. 4, 1928 (TEX); San Patricio Co.: *Cory* 45389 (GH); Tarrant Co.: *Ruth* 1242 (NY); Titus Co.: *Jones* 10 (TEX); Travis Co.: *Tharp* 1717 (TEX); Washington Co.: *Brackett* July 15, 1938 (GH, TEX).

15c. *P. angulata* L., var. *lanceifolia* (Nees) Waterfall, comb. et stat. nov., based on *P. lanceifolia* Nees, Linnaea 6: 473. 1831.

Similar to var. *pendula*, but leaves lanceolate to linear-lanceolate, and corolla usually only 4–5 mm. long; anthers often only 1–1.5 mm. long.

TYPE: No collections were cited by Nees who said "Habitat in Peruvia

(Ruiz et Pavon); in Mexico (Herb. Hort. Reg. Ber.)". A Neotype should be selected, but preferably after a study of Peruvian and Mexican material. Specimens cited below appear to be similar to a number of Mexican collections seen by the author.

Variety *lanceifolia* grows in wet areas, river valleys, fields and other disturbed habitats in California, Arizona, New Mexico and to a lesser extent in Texas and southern Oklahoma, often being atypical in the latter two states, probably due to gene interchange with var. *pendula*; a few Florida collections are also referred here; it flowers usually in June to September, or as late as November in the warmer parts of its range.

Selected from 64 sheets of 41 collections: ARIZONA: Cochise Co.: *Thornber* 2627 (GH), put here because the anthers are only about 1 mm. long, even though the leaves are broad; Pima Co.: *Pringle* Aug. 5, and Sept. 5, 1884 (NY, PH, UC); Pinal Co.: *Kearney* 15067 (ARIZ); Yuma Co.: *Schott* 2 (NY); CALIFORNIA: Butte Co.: *Heller* 13355 (GH); Fresno Co.: *Bacigalupi*, *Ferris* and *Wiggins* 2488 (GH, NY, UC); Imperial Co.: *Parish* 8337 (GH); Los Angeles Co.: *Wheeler* 965 (UC); Merced Co.: *Hoover* 1599 (UC); San Diego Co.: *Spencer* 1014 (GH); Stanislaus Co.: *Hoover* 2442 (UC); Tulare Co.: *Michener* and *Bioletti* 1893 (NY); FLORIDA: Dade Co.: *Small* and *Carter* 649 (NY, PH); Kevy Co.: *Small*, *Small* and *DeWinkeler* 10036 (NY); Monroe Co.: *Eyles* 8213 (GH, OKL); NEW MEXICO: Dona Ana Co.: *Archer* 489 (MICH); *Kearney* and *Peebles* 15073 (ARIZ); OKLAHOMA: McCurtain Co.: *Waterfall* 7604 (OKL, OKLA); Oklahoma Co.: *Waterfall* 2893, near var. *pendula* (OKL); Payne Co.: *James* 37 (OKLA); TEXAS: Brewster Co.: *Cory* 31275 (GH); Cameron Co.: *Runyon* 4243 (TEX); Llano Co.: *Bray* 10 (NY); Presidio Co.: *Warnock* T164 (GH, TEX); Refugio Co.: *Tharp* Sept. 7, 1929 (TEX); Travis Co.: *Tharp*, *Warnock* and *Barkley* Nov. 31, 1945, atypical material, perhaps intermediate with var. *pendula* (COLO, DUKE, GH, NY, OKL, OKLA, UARK, UC).

#### 16. ***Physalis pubescens*** Linnaeus, Species Plantarum 1: 183. 1753. Synonymy listed under the varieties.

Plants annual, 15–60 cm. tall, villous or viscid-villous vestite, sometimes with granular glands, sometimes glabrate; blades of principal leaves usually 3–10 cm. long, narrowly to broadly ovate, on petioles half as long to about equal them in length; margins of the leaves toothed to entire; corolla 6–10 mm. long, yellow with 5 prominent dark spots on the limb near its base; anthers 1.5–2 (2.4) mm. long, blue; flowering calyx 4–7 mm. long, its lobes 2–4 mm. long; flowering peduncles 3–12 mm. long; fruiting calyx 2–4 cm. long and 1.5–2.5 cm. wide, 5 angled, on peduncles 5–20 mm. long.

16a. ***P. pubescens*** L., var. ***pubescens***. *P. turbinata* Medicus, Academia Theodora-palatina 4: 188–192. 1780; *P. barbadensis* Jacquin, Miscellanea Austriaca Sive Plantarum Selectarum 360. 1781; *P. obscura*, var. *viscido-pubescent* Michx., Flora Boreali-Americana 1: 149. 1803; *Alicabon barbadense* (Jacq.) Rafinesque, Sylva Telluriana 56–57. 1838; *P. viscido-pubescent* (Michx.) Dunal, in DeCandolle's Prodromus 13(1): 442. 1852; *P. floridana* Rydberg, in Small, Flora of the Southeastern United States 983. 1903.

Plants more or less villous; leaf blades usually with 5–8 teeth on each side, usually not translucent; flowering peduncles 3–7 mm. long; fruiting calyces 2–3 cm. long on peduncles usually 5–9 mm. long.

TYPE: "In India utraque." A photograph of the type is in the Arnold Arboretum's collection of photographs of specimens in the Linnaean Herbarium, London.

Variety *pubescens* grows in swamps, margins of lakes, sand dunes, brush, fields and other disturbed habitats, primarily from Florida to Texas in our area; it flowers from May through November. It is a widespread pantropical taxon.

Selected from 81 sheets of collections: FLORIDA: Broward Co.: *Moldenke* 480 (NY); Dade Co.: *Small* and *Small* 4632 (DUKE, NY); Franklin Co.: *Chapman* 3055b (GH, NY); Highlands Co.: *Moldenke* 5417 (NY); Hillsboro Co.: *Churchill* March 28, 1936 (GH); Lake Co.: *Nash* 1251 (GH, MICH, NY, UC, PH); Lee Co.: *Tracy* 7612 (GH, NY); Monroe Co.: *Killip* 41456 (NY, UC); Pinellas Co.: *Williams* Mar. 12, 1926 (DUKE); Polk Co.: *McFarlin* 5924 (MICH); St. Lucie Co.: *Small* 8507 (GH, NY); ILLINOIS: Jackson Co.: *Vasey* (GH); LOUISIANA: *Hale* (GH); TEXAS: Bexar Co.: *Metz* 771 (MICH); Brazos Co.: *Moncreif* 1476 (TEX); Gonzales Co.: *Tharp* Aug. 12, 1940 (TEX); Harris Co.: *Fisher* Oct. 9, 1917 (UC); Hidalgo Co.: *Walker* 8 (GH, TEX); Jackson Co.: *Warnock* 105 (TEX); Jefferson Co.: *Tharp* Sept. 10, 1937 (GH, TEX); McLennan Co.: *Smith* 59 (TEX); Newton Co.: *Tharp* 52141 (GH); Nueces Co.: *Tharp* and *Brown* 48-165 (TEX); Travis Co.: *Tharp* Nov. 8, 1929 (GH, OKLA, TEX); Willacy Co.: *Johnston* 542221 (TEX); Williamson Co.: *Wolcott* 314 (TEX).

16b. *P. pubescens* L., var. *glabra* (Michx.) Waterfall, comb. nov., based on *P. obscura* Michx., var. *glabra* Michx. *Flora Boreali-Americana* 1: 149. 1803. *P. obscura* Michx., l.c. *P. hirsuta* Dunal, var. *repandodentata* Dunal, in DeCandolle's *Prodromus* 13(1): 445. 1852; *P. barbadensis* Jacq., var. *obscura* (Michx.) Rydb., *Mem. Torr. Bot. Club* 4: 327. 1896; *P. barbadensis* Jacq., var. *glabra* (Michx.) Fernald, *RHODORA* 51: 82. 1949.

When Michaux described *P. obscura* he immediately divided it into two varieties, var. *glabra* and var. *viscido-pubescens*. The present author interprets var. *glabra* as being the "typical" variety.

This material has been referred recently, by some American authors, to *P. turbinata* Medicus, *Academia Theodora-palatina* 4: 188-192. 1780. However, in describing this species Medicus says "Die Hauptstamme und nebenaste sind vierkandigt, haarich und rotlich violet-braun." One might dismiss the reddish violet-brown color, as either not necessarily being a characteristic of the whole taxon, or as possibly not being retained in herbarium specimens, but it seems dubious if the term "hairy" would be used to describe nearly glabrous, or slightly puberulent specimens. It seems that the taxon described by Medicus, at least as the name has been applied in our flora, is more likely referable to var. *pubescens*.

Plants glabrous or sparingly puberulent, but not villous as in the other varieties; blades of the principal leaves usually 2-7 cm. long, ovate, often rather broadly so, acuminate in many specimens; margins of the leaves irregularly toothed, sometimes saliently so; petioles about equalling the blades in length; anthers 1.8-2.4 mm. long, bluish; flowering calyx 5-7 mm. long with narrow lanceolate-acuminate lobes 2.5-4 mm. long; flowering peduncles 5-12 mm. long; fruiting calyx 3-4 cm. long, ovate or broader in outline, often acuminate at the apex, on peduncles 1-2 cm. long.

TYPE: In the Herbarium of Michaux, Mus. Hist. Nat., Paris; photograph in the Gray Herbarium.

Variety *glabra* grows in open woods, creek sides, valleys, yards and other disturbed habitats, mostly in southeastern coastal states from North Carolina to Texas, and inland in Arkansas and Missouri; it usually flowers from July through October.

Selected from 47 sheets of 34 collections: ALABAMA: Crenshaw Co.: *Reed* 2103 (TEX); Mobile Co.: *Mohr* Aug. 1883 (MICH); ARKANSAS: Drew Co.: *Demaree* 16498 (NY); Fulton Co.: *Bush* 961 (NY); Hot Springs Co.: *Demaree* 19471 (NY); Logan Co.: *Palmer* 24209 (UARK); Saline Co.: *Moore* 53-311 (UARK); FLORIDA: Dade Co.: *Tatnell* 620 (PH); Gadsden Co.: *Curtiss* 5896 (GH, UC); GEORGIA: Calhoun Co.: *Thorne* 7338 (GH); CALIFORNIA: San Diego Co.: *Jones* March 1882 (PH); LOUISIANA: Calcasieu Parish: *Correll* and *Correll* 9566 (DUKE, GH, NY, PH); Natchitoches Parish: *Palmer* 8777 (PH); Vermilion Parish: *Tharp* July 27, 1929 (TEX); MISSISSIPPI: Oktibbeha Co.: *Pollard* 1338 (GH); MISSOURI: Barry Co.: *Bush* 547 (NY); Butler Co.: *Eggert* July 1893 (NY, UC); Madrid Co.: *Bush* 189 (GH, NY); NORTH CAROLINA: *Curtis* (GH); PENNSYLVANIA: Bucks Co.: *Moyer* (PH); TEXAS: Bowie Co.: *Heller* and *Heller* 4253 (GH, NY, PH); Harris Co.: *Hall* 503 (GH, NY); Newton Co.: *Tharp* 42-141 (GH, TEX); Orange Co.: *Tharp* 2518 (TEX); Rusk Co.: *Reverchon* 3239 (NY).

16c. *P. pubescens* L., var. *integifolia* (Dunal) Waterfall, comb. nov., based on *P. hirsuta* Dunal, var. *integifolia* Dunal, in DeCandolle, Prodromus 13(1): 445. 1852.

Plants more or less villous; leaf blades often entire, sometimes 3-4 (rarely more) more or less prominent teeth on each side, translucent or semitransparent; fruiting calyx 2-3 cm. long on peduncles 5-9 mm. long.

Included here are the plants, primarily of the northeastern United States, which have been referred to *P. pubescens* by recent American authors.

TYPE: "Physalis, n. 30, un. itin., Frank e sylvaticis agri Cincinnati civ. Ohio," presumably in the De Candolle collection in the Conservatoire et Jardin Botaniques, Genève, Switzerland.

Variety *integifolia* grows on creek banks, lake shores, woods, hills and various disturbed habitats, mostly from Pennsylvania to Iowa and south to Florida and south central Texas, but also in southern New Mexico, Arizona and California; it is less frequent in southeastern United States than var. *pubescens*.

Selected from 166 sheets of 132 collections: ALABAMA: Jefferson Co.: *Karle* June 18, 1899 (NY); Tuscaloosa Co.: *Pollard* and *Mazon* 331 (GH); ARIZONA: Pima Co.: *Toumey* Aug. 30, 1895 (UC); ARKANSAS: Baxter Co.: *Moore* 510540 (OKLA, UARK); Clay Co.: *Demaree* 20311 (OKLA, NY, UC); Crawford Co.: *Demaree* 15300 (NY); Garland Co.: *Demaree* 16190, 21841, 20422 (NY); Newton Co.: *Moore* 430237 (OKLA, UARK); Perry Co.: *Demaree* 20168 (NY); Polk Co.: *Moore* and *Williams* Aug. 15, 1951 (UARK); Pulaski Co.: *Demaree* 16640 (NY); Sevier Co.: *Demaree* 9913 (NY, UC); Union Co.: *French* 500150 (UARK); Washington Co.: *Giles* 429 (UARK); Yell Co.: *Demaree* 20109 (NY); CALIFORNIA: Colusa Co.: *Stinchfield* 460 (NY); Imperial Co.: *Thomas* (GH, NY); Lake Co.: *Baker* 11226 (UC); San Diego Co.: *Orcutt* Mar. 6, 1883 (MICH); Tulare Co.: *Congdon* Oct. 8, 1881 (UC); FLORIDA: Dade Co.: *Small* and *Moiser* 5902 (GH,

NY); Leon Co.: *Godfrey* 52473 (DUKE); ILLINOIS: Adams Co.: *Seymour* Sept. 26, 1876 (DUKE); Massac Co.: *Gleason* 2630 (GH); INDIANA: Grant Co.: *Deam* 15287 (NY); Lawrence Co.: *Kriebel* 2564 (DUKE); Putman Co.: *Banker* 1499 (NY); Tippecanoe Co.: *Boot* Oct. 6, 1895 (GH); Whitley Co.: *Friesener* 16539 (GH, NY); KANSAS: Riley Co.: *Norton* 366 (GH, NY); KENTUCKY: Bell Co.: *Lloyd* Aug. 10, 1888 (NY); Hickman Co.: *McFarland* and *Anderson* 2223 (NY); MARYLAND: Montgomery Co.: *Blanchard* Aug. 12, 1892 (NY); Worcester Co.: *Canby* Sept. 1863 (NY); MASSACHUSETTS: Suffolk Co.: *Perkins* Sept. 6, 1881 (NEBC); MISSOURI: Butler Co.: *Eggert* July 1893 (UC) on sheet with var. *obscura*; Jackson Co.: *Bush* 6423 (GH, NY); Jasper Co.: *Demaree* 4424 (OKLA, UARK); Moniteau Co.: *Steyermark* 70814 (UARK); Newton Co.: *Palmer* 32492 (NY); Osage Co.: *Jeffrey* 366 (GH); Phelps Co.: *Kellogg* 196 (NY, TEX, UC); St. Louis Co.: *Eggert* Aug. 14, 1891 (TEX, UC); NEW MEXICO: *Rusby* 310, Burro Mts. (GH, NY); NORTH CAROLINA: Brunswick Co.: *Blomquist* 4811 (DUKE); Carteret Co.: *Lewis* 234 (NY); Washington Co.: *Correll* 1921 (DUKE); OHIO: *Moldenke* 13543 (OKLA); Franklin Co.: *Gleason* Sept. 5, 1904 (GH); Hamilton Co.: *Lloyd* 2209 (MICH); Lake Co.: *Werner* 141 (GH); OKLAHOMA: Cherokee Co.: *Waterfall* 9661 (OKLA); Delaware Co.: *Wallis* 2732 (OKLA); Johnston Co.: *Houghton* 3572½ (NY); Murray Co.: *Hopkins* and *Cross* 6429 (OKL); Muskogee Co.: *Waterfall* 10139 (OKLA); Ottawa Co.: *Stevens* 2530 (GH, NY); Payne Co.: *Thompson* 82 (OKLA); PENNSYLVANIA: Allegheny Co.: *Porter* Aug. 28, 1896 (GH, NY); SOUTH CAROLINA: Berkeley Co.: *Godfrey* and *Tryon* 622 (GH, NY); TENNESSEE: Cheatham Co.: *Svenson* 10395 (UC); Davidson Co.: *Svenson* 9494 (GH); Hamilton Co.: *Clalmgh* 101 (DUKE); TEXAS: Cameron Co.: *Johnston* 542210 (TEX); Dallas Co.: *Reverchon* 382 (GH); Gonzales Co.: *Tharp* 51-467 (OKLA, TEX); Jackson Co.: *Warnock* 105 (NY); Travis Co.: *Armor* 5508 (OKLA) approaching var. *pubescens*; Willacy Co.: *Davis* and *Johnston* 53256.15 (TEX); VIRGINIA: Henrico Co.: *Fernald* and *Long* 12794 (GH); Isle of Wight Co.: *Fernald* and *Long* 13442 (GH); James City Co.: *Fernald* and *Long* 13441 (GH); Loudon Co.: *Holms* Aug. 1888 (ARIZ, NY); Nansemond Co.: *Fernald* and *Long* 10810 (GH); Northampton Co.: *Canby* Sept. 1878 (NY); Page Co.: *Steele* and *Steele* 197 (GH, NY); Princess Anne Co.: *Fernald* and *Long* 4167, 4168, 10809 (GH); WEST VIRGINIA: *Mertz* Sept. 22, 1878 (NY).

16d. **P. pubescens** L., var. **grisea** Waterfall, var. nov., *Planta grisea*, nunc villosa nunc brevipilosa, nunc glandulari-farinacea; foliis ovatis sinuato-dentatis; calycibus fructu a pendunculis 5-9 mm. longis.

Stems densely covered with long, jointed hairs, or with long and short hairs mixed, or densely short viscid-hairy; leaves usually short hairy, sometimes with granular glands, the surfaces having a greyish appearance; leaf blades ovate, coarsely and irregularly 6-9 dentate, or sinuate dentate nearly to their bases; fruiting calyces on peduncles 5-9 mm. long.

This is the taxon, primarily of the northeastern United States, that has been passing as *P. pruinosa* L. However the photograph of the type of *P. pruinosa* in the Arnold Arboretum of Harvard University shows a plant with a more prominent acumination of the leaf blade, and a much longer flowering peduncle than is found in any of our material. The author has been unable to determine the application of the name, *P. pruinosa*. He has seen no material comparable with the photograph of the type.

TYPE: *Walter Deane* Sept. 24, 1884, Cambridge, Mass. (GH; isotype: NY).

Variety *grisea* grows on mountainsides, wooded slopes, roadsides, in gardens and various disturbed habitats, principally in northeastern United States; it usually flowers in August, September and October.

Selected from 114 sheets of 102 collections: CANADA—ONTARIO: *Macoun* 54524 (NY); UNITED STATES—ALABAMA: Baldwin Co.: *Dukes* 118 (NY); CALIFORNIA: Inyo Co.: *Roos* and *Roos* 6221 (UC); CONNECTICUT: New Haven Co.: *Blewitt* 1381 (NEBC); DELAWARE: New Castle Co.: *Latnall* 1882 (GH); FLORIDA: *Chapman* (NY); GEORGIA: DeKalb Co.: *Small* Aug. 1–6, 1895 (NY); ILLINOIS: DuPage Co.: *Umbach* 12484 (GH); Macon Co.: *Mills* Sept. 29, 1940; INDIANA: Lawrence Co.: *Kriebel* 2538 (DUKE, GH); KANSAS: *Imler* 68 (NY); KENTUCKY: *Short* 1840 (NY); MAINE: Cumberland Co.: *Chamberlain* 1127 (NEBC); MASSACHUSETTS: Barnstable Co.: *Collins* 950 (NEBC); Bristol Co.: *Hervey* (NEBC); Dukes Co.: *Bicknell* 7704, 7706, 7693 (NY); Essex Co.: *Morong* Aug. 1, 1868 (NY); Hampshire Co.: *Torrey* and *S.J.E.* Sept. 16, 1943 (DUKE); Middlesex Co.: *Fernald* Sept. 26, 1908 (GH); Nantucket Co.: *Flynn* July 30, 1904 (NEBC); Norfolk Co.: *Kidder* Aug. 23, 1888 (NEBC); Plymouth Co.: *Williams* Aug. 21, 1898 (NEBC); Suffolk Co.: *Young* Sept. 1878 (GH, NEBC); Worcester Co.: *Woodward* 2 (GH); MICHIGAN: St. Claire Co.: *Dodge* Aug. 25, 1906; MISSOURI: Barry Co.: *Bush* 564, 469 (NY); Christian Co.: *Blankenship* Aug. 1, 1895 (GH); Jackson Co.: *Mackenzie* 7 (MICH); Jasper Co.: *Bush* 10402 (GH, NY); Taney Co.: *Bush* 170 (GH); NEW JERSEY: *Hastings* Sept. 6, 1917 (NY) foot of Palisades; NEW YORK: Chemung Co.: *Lucy* 7825, 11098 (NY); Oswego Co.: *Sheldon* 6008 (UC); Tompkins Co.: *Hoisington* 312 (OKL); Washington Co.: *Burnham* Sept. 25, 1896 (GH); NORTH CAROLINA: Granville Co.: *Godfrey* 2060 (GH); Jackson Co.: *Thaxter* June–July 1887 (GH); Swain Co.: *Beardslee* and *Kofoid* Aug. 15, 1891 (GH); OREGON: Tillamook Co.: *Lloyd* Sept. 10, 1894 (NY); PENNSYLVANIA: Bucks Co.: *Fretz* Sept. 7, 1901 (GH); Lancaster Co.: *Small* Sept. 1889 (GH); Westmoreland Co.: *Shafer* and *Medayer* 182 (UC); RHODE ISLAND: Providence Co.: *Leland* Sept. 18, 1881 (NEBC); TENNESSEE: Knox Co.: *Ruth* 3411 (NY); TEXAS: De Witt Co.: *Riedel* Aug. 3, 1941 (TEX); VERMONT: Bennington Co.: *Ames* May 1885 (MICH); Chittenden Co.: *Flynn* 3 (GH); Rutland Co.: *Eggleston* 1510 (GH, NEBC); VIRGINIA: Bedford Co.: *Curtiss* Oct. 3, 1871 (GH); Page Co.: *Steele* and *Steele* Aug. 28, 1901 (GH, NY); WASHINGTON: Klickitat Co.: *Suksdorf* 2285 (NY); Yakima Co.: *Henderson* 2496 (GH).

17. **P. foetens** Poiret, var. **neomexicana** (Rydb.) Waterfall, comb. et stat. nov., based on *P. neomexicana* Rydb., Mem. Torr. Bot. Club 4: 325–326. 1895.

Plants annual, 10–60 cm. tall, usually branched; indument short (0.5–1 mm. long) and usually dense, more or less yellowish or brownish capitate-glandular; leaf blades 3–6 cm. long, ovate to oblong-ovate or lanceolate-ovate, their margins toothed, or sometimes sinuate-toothed; petioles one-half to three-fourths as long as the blades; corollas 6–7 mm. long, bluish spotted; anthers (0.3) 1–1.5 (2) mm. long, bluish, on filiform filaments; flowering calyces 3–4.5 mm. long, on peduncles usually 1.5–3 mm. long; fruiting calyces 2–3 cm. long, more or less ovate in outline, sharply 5-angled, on peduncles mostly 4–7 mm. long.

This variety differs from var. *foetens* of Mexico primarily in its shorter anther-length (2–3 mm. in var. *foetens*), usually shorter corolla (as much as 1 cm. long in some Mexican material) and in having fewer yellowish or brownish capitate glands than var. *foetens*.

TYPE: In describing *P. neomexicana*, Rydberg cited several collections, but designated none of them as type. From among those cited, *Fendler* 678 (GH) is selected as the LECTOTYPE. A second sheet of the same collection, an isolectotype, is in the same herbarium.

Variety *neomexicana* grows in the mountains, often with junipers and pines, and in adjacent areas, including cultivated fields, in New Mexico and adjacent Colorado and Arizona; it flowers in June through October.

Selected from 48 sheets of 40 collections: ARIZONA: Graham Co.: *Bohrer* 409 (ARIZ); Greenlee Co.: *Gould* and *Haskell* 4080 (UC); Maricopa Co.: *Rusby* 310 (MICH); Navajo Co.: *Wooton* September 13, 1913 (ARIZ); Pima Co.: *Toumey* Aug. 30, 1894 (NY); Yavapai Co.: *Wilcox* Sept. 1918 (ARIZ); COLORADO: *Porter* July 1872 (PH); El Paso Co.: *Livingston* 497 (DUKE); NEW MEXICO: Colfax Co.: *Standley* 13869 (NY); Bernalillo Co.: *Ellis* 287 (NY); Grant Co.: *Rusby* Oct. 1881 (MICH); Lincoln Co.: *Skehan* 60 (GH, NY); *Wooton* 633, 635 (NY); Rio Arriba Co.: *Parker* and *McClintock* 6449 (ARIZ, UC); San Miguel Co.: *Standley* 4920 (GH, NY), *Nelson* 11568 (UC); Santa Fe Co.: *Heller* and *Heller* 3803 (GH, NY); Sierra Co.: *Metcalfe* 1210 (GH, NY, UC); Socorro Co.: *Metcalfe* 425 (NY); Torrance Co.: *Parker* and *McClintock* 6529 (NY); Socorro or Grant Co.: *Rusby* 309, Mogollon Mts. (MICH).

18. ***Physalis latiphysa*** Waterfall, sp. nov. Planta annua, 15–45 cm. alta, ramosa, plus minusve villosa; foliorum laminis 5–7 cm. longis, ovatis vel ovatis-rotundis, integris vel paucidentatis, acuminatis; corollis maculatis, 4–6 mm. longis; antheris coeruleis, 1.5–2 mm. longis; calycibus fructu (2.5) 3–4 cm. latis; pedunculis 1–1.5 cm. longis.

Annual, 15–45 cm. high, branched, more or less villous; blades of the principal leaves 5–7 cm. long, ovate to ovate-rotund, thin and translucent, their margins from entire to having a few teeth, acuminate; petioles 1.5–7 cm. long; corollas yellow, dark-spotted, small, 4–6 mm. long; flowering calyces 3–4 mm. long with lobes about half that long, on peduncles 3–8 mm. long; fruiting calyces sparsely appressed-hairy, strongly 5-angled, 2.5–4 cm. long and (2.5) 3–4 cm. wide; fruiting peduncles 1–1.5 cm. long; linear-subulate calyx lobes 7–10 mm. long, extending 5–7 mm. beyond the body of the inflated fruiting calyx.

TYPE: *T. H. Kearney* and *R. H. Peebles* 14425, Rondstadt Ranch, plain east of Baboquivari Mts., Pima Co., Arizona, Sept. 23, 1939. It is deposited in the Herbarium of the University of Arizona.

In addition to the type, the following collections have been seen: ARIZONA: Pima Co.: *Bartram* 237 Santa Catalina Mts., east of Pima Canyon, Jan. 16, 1920 (PH); *Kearney* and *Peebles* 10427, Toro Canyon, Baboquivari Mts., Sept. 30, 1934 (ARIZ, MICH); *Kearney* and *Peebles* 14932, South Canyon, Baboquivari Mts., Aug. 31, 1940 (ARIZ); Santa Cruz Co.: *Harrison* and *Hope* 9058, Forty miles south of Tucson on Sasabe Road, Sept. 11, 1932 (ARIZ); *Harrison* and *Fulton* 8158, Nogales, Aug. 30, 1931 (ARIZ); County undetermined; *Harrison* 9058, Robles to San Fernando, Sept. 10, 1932 (GH, MICH); *Harrison*, *Kearney* and *Hope* 8950 half-way from Sasabe to Robles, Aug. 21, 1932 (ARIZ); *Kearney* and *Peebles* 10576, Florida Canyon, Santa Rita Mts., Oct. 7, 1934 (ARIZ).

19. ***Physalis missouriensis*** Mackenzie and Bush, Trans. Acad. Sci. St. Louis 12: 84–85. 1902.

Annual, usually branched above, villous, sometimes with shorter hairs, often somewhat viscid; principal leaf blades 2–6 cm. long, ovate to narrowly ovate, dentate to sinuately dentate, or sometimes entire; petioles one-third the length of, to nearly as long as the blades; corolla yellow, not dark spotted, 7–10 mm. long; anthers (0.6) 1–1.2 mm. long, bluish, on slender filaments; flowering calyx 3–4 mm. long, its lobes 1–2 mm. long, on peduncles 3–6 mm. long; fruiting calyx 1.5–2.5 cm. long, ovoid, on peduncles 5–10 mm. long.

This species is easily distinguished from *P. pubescens* by its unspotted corollas and its smaller anthers.

TYPE: K. K. Mackenzie 485, Rocky soil, Red Bridge, Jackson Co., Missouri. The type was deposited in the "Herbarium of K. K. Mackenzie." Isotypes: GH, MICH, WIS.

*P. missouriensis* grows in rocky woods and limestone barrens, mostly in Missouri, northeastern Kansas, western Arkansas, with two collections from adjacent Oklahoma, and one collection, dubiously referred here, from southwestern Texas; it flowers from June through October.

Collections examined: ARKANSAS: Carroll Co.: Palmer 29310 (UARK); Hempstead Co.: Palmer 8955 (PH); Washington Co.: Moore 3008 (UARK); Moore and Iltis 430209 (OKLA, UARK); Giles 404 (UARK); J. T. B. 645 White River (UARK); KANSAS: Douglas Co.: Snow 2210 (KANU); McGregor 9703 (KANU); Marshall Co.: Horr 4610 (KANU); Riley Co.: Gates 18566 (GH, TEX, UC); Hitchcock 402 (GH); Shawnee Co.: Volle 737 (KANU); MISSOURI: Barry Co.: Bush 162 (OKL); Jackson Co.: Bush June 27, 1887 (GH), Aug. 1888 (GH, NY); 772 (GH, NY), 4079 (GH), 7334 (GH), 7695 (GH, NY), 12298 (NY), 12298A (NY); Mackenzie 360 (NY), Aug. 23, 1896 (GH, NY); 485 (MICH); Jefferson Co.: Prince July 4, 1883 (GH); Phelps Co.: Kellogg Oct. 22, 1913 (TEX); Platte Co.: Bush 11804 (NY); St. Louis Co.: Eggert July 20, 1887 (GH), Aug. 21, 1891 (NY); Pennell 11701 (PH); Taney Co.: Bush 173 (GH, NY); County undetermined; Blankenship 1893 (NY); Nelson 5 (NY); OKLAHOMA: Muskogee Co.: Little 2568 (OKL); Ottawa Co.: Stevens 2351 (GH, on sheet with Stevens 2530, *P. pubescens*); TEXAS: Brewster Co.: Cory 35570, five and three-quarter miles east of Alpine, Sept. 19, 1940 (GH) is somewhat doubtfully referred to this taxon.

20. **Physalis Greenei** Vasey and Rose, Contr. U. S. Natl. Herb. 1: 18. 1890; *P. pedunculata* Greene, Pittonia 1: 268–269. 1899, non Mart. and Gal., Bull. Acad. Brux. 12: 132. 1842.

Annuals, villous or short pilose, glandular and viscid; principal leaf blades 2–4 cm. long, ovate; petioles one-half as long as to slightly longer than the blades; leaf margins dentate to sinuate-dentate, or rarely entire; corolla 8–10 mm. long, yellowish, or sometimes with a slightly darker tinge; anthers 1.5–2.5 mm. long, yellow, on slender filaments; flowering calyx 3–4 mm. long on peduncles 15–30 mm. long; fruiting calyx 2–2.5 cm. long, pointed-ovoid, on peduncles 15–40 cm. long.

The smaller anthers of this species will serve to distinguish it, and separate it from *P. crassifolia* in those instances in which they tend to resemble each other.

TYPE: Charles F. Pond Feb. 1889, Cedros Island, off the coast of Lower California; "southwest side of the island" according to Greene; type and isotype (US).

*P. Greenei* grows on hills and sea-cliffs, southern California; it flowers in February, March and April.

Collections examined: CALIFORNIA: Orange Co.: Abrams June 12, 1901 (NY); Mason 2933 (GH, UC); Placer Co.: Jones 88 (GH); San Diego Co.: Abrams 3309 (GH, NY, PH, UC, US); Allen 77 (GH); Jones March 1882 (GH, UC); Wiggins 1821 (UC).

21. ***Physalis lobata*** Torrey, Ann. Lyc. Nat. Hist. New York **2**: 226–227. 1828; *Quincula lobata* (Torr.) Rafinesque, Atlantic Journal, **1**: 145. 1832; *P. sabeana* Buckley, Proc. Acad. Sci. Phil. **14**: 6. 1863; *Chamaesaracha physaloides* Greene, Bull. Torr. Bot. Club **9**: 122. 1882; *Quincula lepidota* Aven Nelson, Bot. Gaz. **47**: 430. 1909.

*Chamaesaracha physaloides* is included here on the basis of Greene's phrase "flat scale-like hairs," which seems to be a good description of the appearance of the characteristic crystalline vesicles of *P. lobata* after they are dried. These structures are not found on *P. Wrightii*, the other species to which this name has been referred.

Perennial, branching from the base, the branches spreading or procumbent; indument consisting of a varying amount of crystalline vesicles, flattening when dried, which may be abundant enough to give the plant a scurfy appearance, or may be very sparse; principal leaves usually 4–10 cm. long, with blades usually 0.5–3 cm. wide, ovate-lanceolate to linear-lanceolate, cuneate at the base to a winged petiole, usually pinnatifid, rarely sinuate-toothed or entire; corollas blue or violet (rarely white), rotate, 1.5–2 cm. broad, with five hairy pads on its base near the point of attachment of the filaments and alternating with them; anthers about 1.5–2 mm. long, yellow, on slender filaments; style twisted and bent to one side; flowering calyx 3–4 mm. long, its lobes 1.5–2 mm. long, deltoid; flowering peduncle 1–3 (5) cm. long; fruiting calyx 1.5–2 cm. long, pentagonal-ovoid, inflated, on peduncles 1–2.5 (3) cm. long; seeds usually somewhat crenate on their backs.

TYPE: James "On the Canadian"; not seen.

*P. lobata* grows on plains, prairies, mesas, canyons, juniper barrens, desert areas and various disturbed habitats principally in western Kansas, Oklahoma and Texas, and eastern Colorado and New Mexico, and southern Arizona.

Three hundred forty seven sheets of 275 collections have been seen from: Arizona, California (Fremont's Expedition in 1845), Colorado, Kansas, Nevada (Clark Co.), New Mexico, Oklahoma and Texas.

A white-flowered forma is rarely found. It may be described as ***P. lobata*** Torr., forma ***albiflora*** Waterfall, f. nov., corollis albis. TYPE: *J. J. Thornber* Aug. 11, 1901, Experiment Station Range Reserve, Pima County, Arizona (ARIZ). Another collection is *B. C. Tharp* and *C. Havard* 49344, 5–6 miles west of Del Rio, Valverde Co., Texas, April 16, 1949 (TEX).

22. ***Physalis Carpenteri*** Riddell ex Rydberg, Mem. Torr. Bot. Club **4**: 330–331. 1896; *P. Carpenteri* Riddell, N. Orl. Med. and Surg. Journ. **759**. 1852, as a *nomen nudum*; Bot. Gaz. **3**: 11. 1847 in synonymy.

Plant over two-thirds of a meter tall, widely branched; herbage short-hairy, the leaf blades sometimes nearly glabrous and the calyces sometimes with a few long hairs; principal leaf blades (3) 7–11 cm. long, ovate to lanceolate-ovate, acuminate; petioles one-third to two-thirds as long as the blades; leaf margins usually entire, sometimes repand; flowers from single to 3–6 in the axils of the leaves; the fascicled flowers apparently due to the presence of a

telescoped axillary branch, sometimes 2–4 cm. long and bearing reduced leaves (*Curtiss 6901*: UC, GH, NY) as well as flowers; corolla about 1 cm. long, yellow; anthers about 2 mm. long, yellow, on slender filaments; flowering calyx 4–5 mm. long on peduncles 5–8 mm. long; fruiting calyx about 1.5 cm. in diameter, nearly spherical, only slightly inflated; fruit having 1 to several plump, rounded, corky, seed-like bodies (possibly a peculiar development of unfertilized ovules) in addition to the normal, more or less reniform, flattened seeds.

The species may be annual, according to some collectors, or from a deep-seated "rootstock" according to others; all the specimens examined were branches only.

The author prefers to leave this species in *Physalis*, regardless of its peculiar characteristics, until a more thorough study of related genera, or possible subgenera, can be made.

Collections examined: ALABAMA: S. B. Buckley, April (NY); FLORIDA: Columbia Co.: Geo. V. Nash 2503, Aug. 29–31, 1895 (GH, MICH, NY); Erdman West, seeds from Fort White, raised by Margaret Young Menzel as her 508a (TEX); Escambia Co.: Curtiss, 1886, Pensacola (GH); Suwanee Co.: A. H. Curtiss 6901, annual 2 ft. high and widely branched, growing in a cultivated field near Wellborn, Sept. 14, 1901 (GH, NY, UC); County undetermined: M. A. Curtis, Florida?; LOUISIANA: East Feliciana Parish: Riddell, March 1878 (GH, one fruiting calyx); Orleans Parish: Drummond New Orleans (GH); Ingals in 1835, New Orleans (NY); West Feliciana Parish: R. S. Cocks, 3603, common in rich woods (NY).—DEPT. OF BOTANY AND PLANT PATHOLOGY AND THE RESEARCH FOUNDATION, OKLAHOMA STATE UNIVERSITY, STILLWATER, OKLAHOMA.

#### LITERATURE CITED

- ANDERSON, EDGAR. 1949. *Introgressive Hybridization*. New York: John Wiley and Sons.
- BENTHAM, GEORGE. 1844. *Botany of the Voyage of H. M. S. Sulphur*. London: Smith and Elder.
- BOWDICH, THOMAS EDWARD. 1825. *Excursions in Madera and Porto Santo*. London: G. B. Whittaker.
- BUCKLEY, S. B. 1863. Descriptions of New Plants from Texas. *Proc. Acad. Sci. Phil.* 14: 6.
- CURTIS, M. A. 1849. New and Rare Plants, Chiefly of the Carolinas. *Am. Journ. Sci. ser. 2.* 1–407.
- DE CANDOLLE, AUGUSTIN PYRAMUS. 1813. *Catalogus Plantarum Monspeliensis*. Monspelii: J. Martel.
- DUNAL, FELIX. 1852. *Physalis* in DeCandolle's *Prodromus Systematis Naturalis Regini Vegetabilis*. Paris: Crapelet.
- FERNALD, M. L. 1947. Additions to and Subtractions from the Flora of Virginia. *RHODORA* 49: 178–179.
- GRAY, ASA. 1875. Synopsis of North American Species of *Physalis*. *Proc. Am. Acad. Arts and Sci.* 10: 62–68.
- GREENE, E. L. 1882. New Western Plants. *Bull. Torr. Bot. Club* 9: 122.  
——— 1900. New or Noteworthy Species. *Pittonia* 4: 150–151.
- HORNEMANN, JENS WILKEN. 1819. *Hortus Botanicus Hafniensis, Supplementum*. Hauniae: E. A. H. Moller.
- JACQUIN, JOSEPH FRANZ. 1844. *Eclogae Plantarum Rariorum*. Vindobonae: L. P.
- JACQUIN, NIKOLAUS JOSEPH. 1781. *Miscellanea Austriaca Sive Plantarum Selectarum*. Vindobonae.

- JEPSON, WILLIS LINN. 1925. A Manual of the Flowering Plants of California. Berkeley: Associated Student's Store, University of California.
- KEARNEY, T. H. 1894. Some New Florida Plants. Bull. Torr. Bot. Club **21**: 485.
- LAMARCK, JEAN BAPTISTE. 1786. Encyclopédie Méthodique Botanique. Paris: Panckoucke.
- LANJOUW, J. AND F. A. STAFLEU. 1954. Index Herbariorum. Regnum Vegetabile **2**: 131–144.
- LINNEAUS, CAROLUS. 1753. Species Plantarum. Holmiae: impensis L. Salvii.
- . 1762. Species Plantarum, ed. 2. Holmiae: impensis L. Salvii.
- MACKENZIE, K. K. AND B. F. BUSH. 1902. New Plants from Missouri. Trans. Acad. Sci. St. Louis. **12**: 79–89.
- MASTERS, MAXWELL TYLDEN. 1894. *Physalis Francheti*. Gard. Chron. **2**: 434 and 441.
- MEDICUS, FRIEDRICH CASIMIR. 1780. Observationes Botanicae. Academia Electoralis Scientiarum et Elegantiarum Litterarum Theodorapalatina. **4**: 188–192, 205 and Tab. 5.
- MENZEL, MARGARET Y. 1951. The Cytotaxonomy and Genetics of *Physalis*. Proc. Am. Phil. Soc. **95**: 132–168.
- MICHAUX, ANDRÉ. 1803. Flora Boreali-americana. Parisiis et Argentorati: fratres Levrault.
- MILLER, PHILLIP. 1768. The Gardener's Dictionary. London: privately printed.
- MOHR, CHARLES. 1899. Notes on Some New and Little Known Plants of the Alabama Flora. Bull. Torr. Bot. Club **26**: 119–120. 1899.
- NEES, D. C. G. (von Esenbeck). 1831. Versuch einer Verstandigung über die Arten der Gattung *Physalis*. Linnaea **6**: 431–483.
- NELSON, AVEN. 1909. Plantae Gooddingianae. Bot. Gaz. **47**: 425–436.
- NUTTALL, THOMAS. 1834. Indigeneous Plants of the United States. Journ. Nat. Sci. Philad. **7**: 112–113.
- POLLARD AND BALL. 1900. Noteworthy Louisiana Plants. Proc. Biol. Soc. Wash. **13**: 134–145.
- RAFINESQUE-SCHMALTZ, CONSTANTINO SAMUEL. 1832. Atlantic Journal and Friend of Knowledge **1**: 145.
- REICHENBACH, HEINRICH GOTTLIEB LUDWIG. 1841. Das Herbarienbuch. Dresden und Leipzig: Arnoldischen Buchhandlung.
- RYDBERG, PER AXEL. 1895. New Species of *Physalis*. Bull. Torr. Bot. Club **22**: 306–308.
- . 1895. Flora of the Sand Hills of Nebraska. Contr. U.S. Natl. Herb. **3**: 171–172.
- . 1896. The North American Species of *Physalis* and Related Genera. Mem. Torr. Bot. Club **4**: 297–374.
- STANLEY, PAUL C. 1937. Studies of American Plants. Field Mus. Publ. Bot. **17**: 273–274.
- TORREY, JOHN. 1828. Plants Collected During a Journey to the Rocky Mountains. Ann. Lyc. Nat. Hist. N. Y. **2**: 226–227.
- . 1859. Botany of the Mexican Boundary. (34th Congress, 1st and 2nd session, Senate Documents, vol. **20**, pt. 2). Washington, D. C.: Govt. Printing Office.
- WATERFALL, U. T. 1950. Some Results of a Third Summer's Botanizing in Oklahoma. RHODORA **52**: 171.